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## EUROPEAN PATENT APPLICATION

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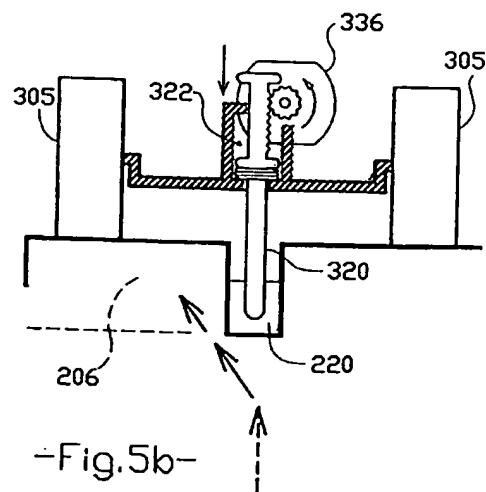
⑳ Applicant: **Ng, Cody Kin Mo  
 Second Floor, Tiptop Mansion, 63 Sheung  
 Shing Street  
 Homantin, Kowloon (HK)**

㉑ Inventor: **Ng, Cody Kin Mo  
 Second Floor, Tiptop Mansion, 63 Sheung  
 Shing Street  
 Homantin, Kowloon (HK)**

㉒ Representative: **Findlay, Alice Rosemary  
 Lloyd Wise, Tregear & Co. Norman House  
 105-109 Strand  
 London WC2R 0AE (GB)**

㉔ Slot track racing apparatus.

㉕ Slot racing track apparatus is disclosed which comprises a base member 120, first and second slots 200, 202 defining respective lanes and at least one lane changing slot 206 connecting the first and second slots together. A lane changing member 220 is disposed at a junction between the lane defining slots 200, 202 and the lane changing slot 206 and a racing vehicle 300 for use on the track is provided with a guide member 320 for engagement in the slots, the degree of protrusion of the guide member into the slots being controlled so that the lane changing member 220 may be selectively engaged by the vehicle 300 so that the vehicle may change lane.



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This invention relates to slot track racing apparatus.

Slot car racing tracks are known. Such tracks generally comprise two or more lanes, each for a racing car model, the lanes being defined by a respective slot which is engaged by a guiding member of the racing model car. Power rails are provided on either side of each slot which engage with corresponding pick-ups on the model so that a driving motor in the model may be powered thereby. Each player has a controller which controls the power supply to the model and thus its speed.

The simplest form of such a slot racing track comprises a circuit in which the two lanes run parallel to one another. In order to increase the interest of the players, obstacles such as chicanes, bridges and cross-overs may be provided. However, such a racing track has the disadvantage that the cars cannot change lane as each lane is associated with a power controller which is associated with a given car and only two cars, one per lane, may be controlled.

There has been proposed a racing track which allows model vehicles to change lane. The vehicles change from one lane to another by sliding across the track. Each lane is provided with two sets of power rails spaced by different distances, one for each car so that each car can use each lane without interference. The race track is consequently complicated and suffers the disadvantage that when changing lane the car speed is reduced because power is not provided. Furthermore, the mechanism used to allow lane changes involves turning the wheels of the car at a sharp angle and this has a braking effect on the car, thus reducing speed.

It is an object of the invention to provide slot track racing apparatus which alleviates the above disadvantages.

According to the invention there is provided a slot track racing apparatus comprising:

a base member;

first and second slots formed in the member, the slots defining respective lanes;

at least one lane changing slot formed in the member and connecting the first and second slots together; and

a lane changing member selectively engageable by said vehicle, the member partially occluding the lane defining slot at the junction between the lane defining slot and the lane changing slot, the leading face of the lane changing slot being slanted at the same angle as the lane changing slot and a vehicle for use on the track, the vehicle including a guide member protruding from the vehicle for engagement in a said slot to be guided thereby and means for controlling the degree of protrusion of the guide member to allow selective engagement with the lane changing means independent of vehicle speed.

The invention also independently provides a slot

racing track in which toy vehicles are raced one against the other by remote control of the toy vehicles, the track comprising at least two longitudinally extending slots, the slots being partially covered to define a longitudinally extending opening narrower than the width of the slot for receiving a slot engagement member of a toy slot racing track vehicle.

Preferably, this aspect of the invention further comprises a racing vehicle having a slot engagement member having a lip wider than the opening for retention in the slot and the member is preferably of cylindrical form and is fully rotatable relative to the chassis.

Specific aspects and features of the invention include, in a first aspect a slot track racing apparatus comprising a base member, first and second slots defining respective lanes; and at least one lane changing slot connecting the first and second slots, in a second aspect a racing vehicle for use on the slotted track, the vehicle including a chassis, a guide member protruding below the chassis for engagement in the slot to be guided thereby and further comprising a motor for powering the vehicle and means for receiving a battery to power the vehicle and wireless control means for controlling the motor, in a third aspect a racing vehicle for use on a slotted track, the vehicle including a chassis and a guide member protruding below the chassis for engagement in the slot to be guided thereby and means for controlling the degree of protrusion of the guide member below the chassis, in a fourth aspect a slot racing track having a longitudinal slot for guiding a slot track racing vehicle, the slot being partially covered to define a longitudinal opening narrower than the width of the slot for receiving a slot engagement member of a said vehicle and, independently, a racing vehicle having a slot engagement member having a lip wider than the opening for retention in the slot and in a fifth aspect a slot track racing apparatus comprising a plurality of slot racing track sections connectable together which form a circuit preferably including a route changing section connected to the racing track sections, the route changing section being connected to an alternative track route which may preferably include a pit stop area.

The slot track racing apparatus of the embodiment of the invention provides an alternative approach to simulation of vehicle racing to the approaches of the prior art. Unlike the prior art, the lanes are not provided with power rails and, instead, the vehicles are themselves self-powered and radio controlled, this simplifying the track structure to a considerable extent. The racing vehicles are guided by slots which define lanes on the track but lane changing slots are provided so that a player may take positional advantage on the track, by using the inner track on a bend, for example. The inclusion of a selective lane changer provided in the vehicle allows the vehicle remotely to follow one of the lane changing

slots when the player desires to overtake or change lane to take positional advantage. Furthermore, the track design whereby a vehicle is locked on to the track can make the racing game faster and more exciting. A particular advantage of the lane changing feature of the track of the invention is that it allows branches in the track to be made, which may form pit stop areas, for example, thus allowing batteries to be replaced and the cars otherwise "serviced".

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a schematic view of a slot racing track being an embodiment of the invention.

Figure 2 illustrates two sections of the track shown in figure 1, with figure 2a being a plan view of the track sections, figure 2b being an enlargement of the circled junction of figure 2a. Figure 2c being a cross section across C-C' of figure 2b and figure 2d being a cross section across D-D' of figure 2b.

Figure 3 shows an alternative track section usable with the track of figure 1.

Figure 4 is a schematic plan view of a racing vehicle for use on the track of figure 1 with figure 4b being a schematic side view.

Figures 5a and 5b are schematic views showing the operation of the lane changing mechanism of the vehicle and track.

Figure 6 illustrates a preferred feature of the vehicle and track for retaining the vehicle on the track, with figure 6a being a perspective view of a track engagement member of a vehicle, figure 6b showing the member of figure 6a engaged with a modified track and figures 6c and 6d showing operation of the track engagement member.

Figure 7a and 7b are views of an embodiment of the invention showing the features of figure 5 and 6 in combination.

With reference to figure 1, an embodiment of slot track racing apparatus according to the invention is shown, which comprises a track generally designated 100 divided up into a plurality of track sections. These track sections comprise, principally, racing track sections 120 which form a continuous circuit and branch track sections 130, which form a pit area.

The racing track sections 120 are shown in more detail in figures 2 and 3.

In figure 2, figure 2a shows two track sections 120 which are connected together in alignment by any suitable means. Each track section is provided with first and second longitudinally extending slots which define lanes 200, 202. Between the slots 200, 202 a plurality of lane changing slots 204, 206 are provided.

Figure 3 shows an alternative track section in which, instead of the lane changing slots 204, 206 being in series, they are in parallel in a criss-cross arrangement.

The slots are all formed in a base member 208

formed of plastics material. The junction between lane defining slot 202 and lane changing slots 204, 206 is shown in more detail in figures 2b-2d. The intended direction of travel of racing vehicles (which are described hereinafter) on the track is that as shown by arrows 210. Slots 206 are slanted away from lane 202 whereas slots 204 are slanted away from lane 200. The slots 206 are for vehicles changing from lane 202 to lane 200 and slots 204 are for vehicles changing from lane 200 to lane 202.

At the junction between the lane from which a car is to move and the respective lane changing slot, a lane changing means in the form of a lane changing member 220 is provided. The lane changing member as shown in figures 2b and 2d partially occludes the slot 202 and has a leading face 222 slanted at an angle the same as the angle of slant of slot 206.

The lane changing member 220 is selectively engageable by a track racing vehicle to allow the vehicle to change lane. With reference to figure 4a, schematic diagram of a vehicle 300 for use on the track 100 is shown. The vehicle is preferably, of ratio 1:30 or 1:32 and comprises a chassis 302 upon which wheels 304, 305 are mounted. Rear wheels 304 are connected via an axle 306 and gearbox 308 to a driving motor 310. A slot engagement member 320 is provided between the front wheels 305. The member 320 is adjustable in position relative to the chassis as shown in more detail in figure 5. The slot engagement member 320, which is of substantially cylindrical form is slidably retained in a housing 322 having a circular opening 324 at one end and, except for a retaining ledge 326 is open at the opposed end. The member 320 includes circular lips 328, 330 and between these lips a toothed rack 332 is provided which engages a corresponding pinion 334 connected to a motor 336. A spring 340 is held captive between lip 330 and housing 322 so as to bias the member 320 to the position shown in figure 5a. When motor 336 is actuated, pinion 334 is rotated anticlockwise thus forcing member 320 to adopt the position shown in figure 5b. It will be noted that in the position shown in figure 5a, the slot engagement member 320 protrudes into slot 202 sufficiently to be guided thereby but above the level of lane changing member 220, whereas, as shown in figure 5b, slot engagement member 320 protrudes further into slot 202 below the level of member 220. In use, when motor 336 is actuated, the lowering of member 320 will cause vehicle 300 moving round the track to engage a lane changing member 220 thus causing the vehicle to follow a lane changing slot, e.g. 206, rather than continuing in a racing lane, e.g. 202, which would be the case when motor 336 was not actuated.

Motors 301 and 336 are powered by a battery pack 340 mounted in the vehicle chassis. Control of the motors 301, 336 is provided via a control circuit 342 by a hand held radio control 344, the vehicle 300

and radio controller 344 each being provided with an aerial 346, 348. The radio controller 344 and control circuit 342 are of standard form as used in any radio controlled vehicle where two controls, stop/go and, for example, left/right (turning the wheels) are provided. The circuit may be simply adapted to control, firstly, the drive motor 310 and, secondly, the control motor 336 (which has only an up/down function). Preferably, both motors have only on/off control (i.e. providing or cutting off power from the battery pack 340 to the motors), with no additional control. However, if desired, there can be a gradual control of motor 310 thus allowing the vehicle 300 to accelerate/decelerate.

In use, two users each have a radio controller 344 controlling their respective vehicle 300 to control both the speed of the vehicle 300 and in which lane the car travels. Thus, one player can manoeuvre his vehicle to overtake the other and can also take advantage of driving in one lane or the other (e.g. taking the innermost line at a bend, rather than the outermost for which the journey distance will be greater).

A variation of the embodiment of the invention of figures 2-5 is shown in figure 6 in which, additionally, means are provided for retaining the vehicle 300 on the track. In this variation, a lane engagement member 350 is provided. The member is of a generally cylindrical form having a central bore 352 running therethrough and provided with circular lips 354, 356 at each end. The member 350 is retained within a cylindrical chamber in chassis 302 as shown in figure 6b so as to be fully rotatable above the axis of bore 352. The slot structure of the track 100 is slightly modified in that slot 360 is slightly wider than the slot 202 of the embodiment of figure 2 and is provided with partial closure members 362, 364 which define therebetween a longitudinal opening 366 through which member 350 protrudes. The member 350 is held in slot 360 by lip 354 thus preventing the car from becoming detached from the track.

The member 350 is rotatable so that if the car wanders from side to side, it will freely rotate thus reducing frictional losses, as shown in figures 6c and 6d.

In figures 7a and 7b an embodiment of the invention is shown in which the embodiments of figures 5 and 6 are combined. In these figures, reference numerals similar to those of figures 5 and 6 are shown, with the addition of 100, which the addition of reference numeral 470 being a modified lane changing member of increased width in conformity with the widened slot. As can be seen, lane engagement member 420 now passes freely through the central lane of track engagement member 454.

The track 100 shown in figure 1 in addition to the racing track sections 120 includes a pit stop area 130. This is comprised of two route changing sections 140 which have a lane changing structure similar to that shown in figure 2a including a single lane changing

slot with associated lane changing member being provided to direct a vehicle from the lane adjacent to the pit stop area 130. The pit stop area 130 includes a through lane 142 and three bays 144.

With regard to the embodiments shown in figures 6 and 7, in the pit stop area, the lips 362/4, 462/4 are omitted, so that the vehicle may be removed from the track. Furthermore, the slots in the pit stop area may have a speed retarding surface, for example latex coated sides or be of a narrower width, to reduce speed in the area 130.

Although a motor and track and pinion arrangement has been described for adjusting the position of the slot engaging member, a solenoid may be used instead.

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly it is appropriate that the appended claims be construed broadly and in a manner consistent with the scope of the invention herein.

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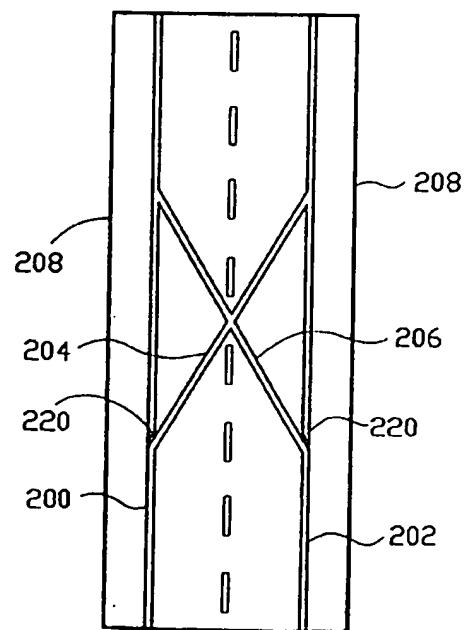
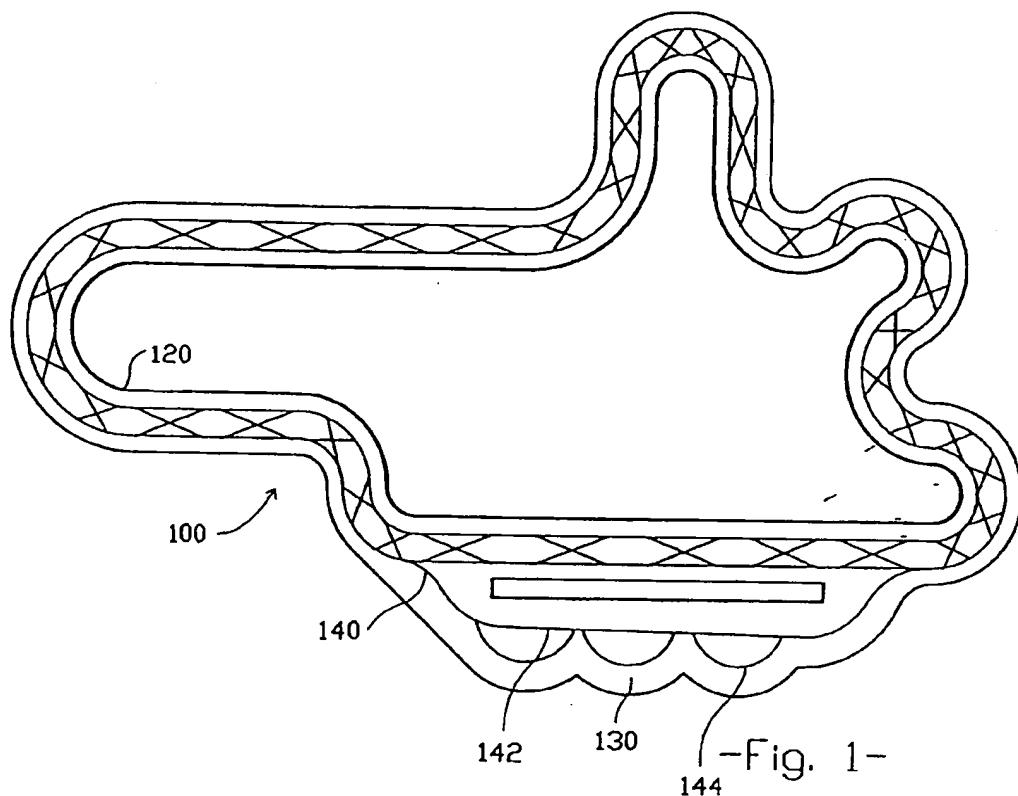
## Claims

1. A slot track racing apparatus comprising:  
a base member;  
first and second slots formed in the member, the slots defining respective lanes;  
at least one lane changing slot formed in the member and connecting the first and second slots together; and  
a lane changing member selectively engageable by said vehicle, the member partially occluding the lane defining slot at the junction between the lane defining slot and the lane changing slot, the leading face of the lane changing slot being slanted at the same angle as the lane changing slot and a vehicle for use on the track, the vehicle including a guide member protruding from the vehicle for engagement in a said slot to be guided thereby and means for controlling the degree of protrusion of the guide member to allow selective engagement with the lane changing means independent of vehicle speed.
2. Apparatus as claimed in claim 1 wherein the lane changing slot is provided at a slanted angle between the lanes.
3. Apparatus as claimed in claim 1 or claim 2 wherein two said lane changing slots are provided each lane changing slot being provided at a slanted angle between the lanes, the slots being slanted in opposite directions.
4. Apparatus as claimed in claim 3 wherein the lane

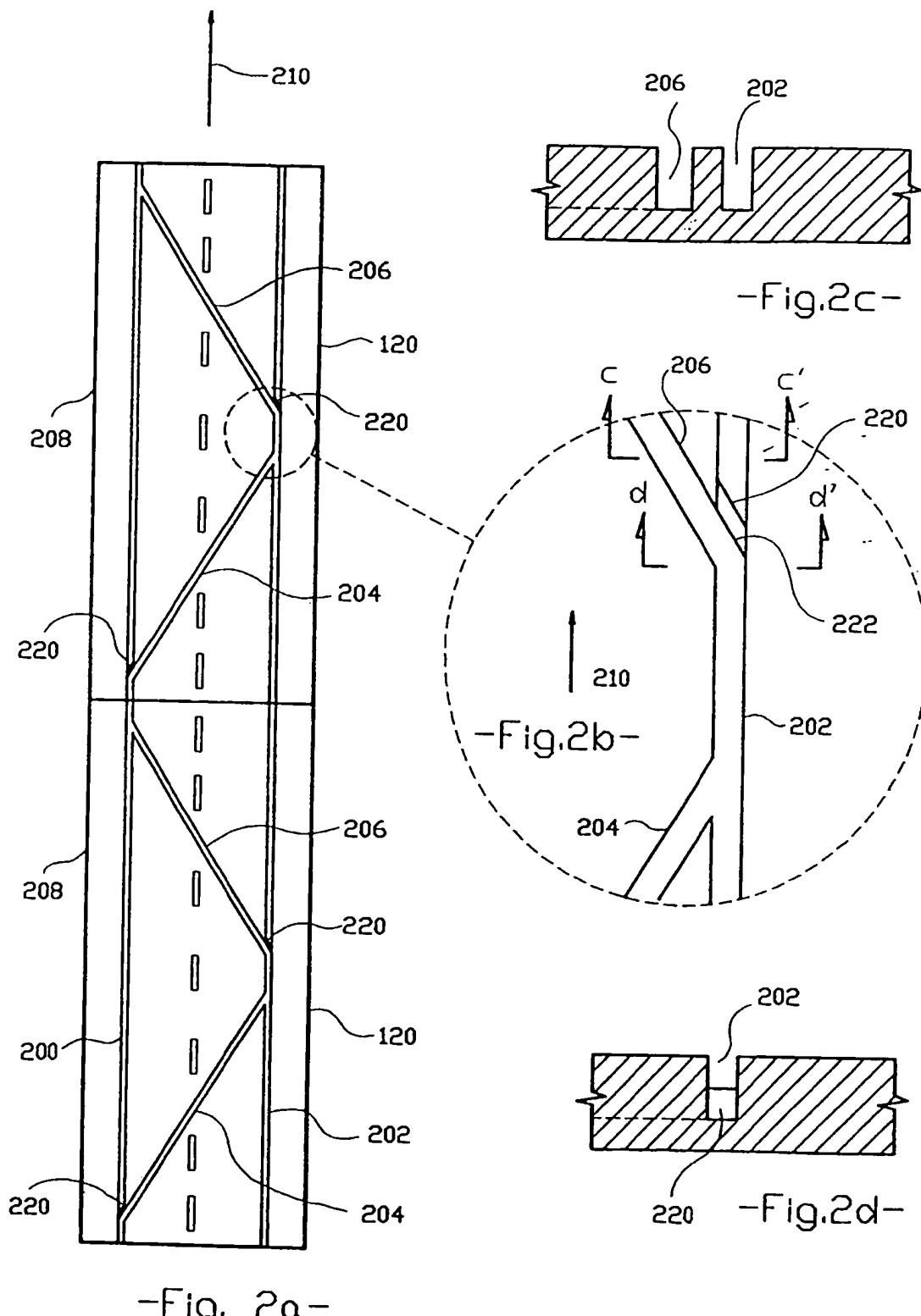
changing slots either are disposed in series or cross one another.

5. Apparatus as claimed in any one of the preceding claims wherein the controlling means comprises means for urging the guide member in a first direction against a biasing means. 5
6. Apparatus as claimed in claim 5 wherein the controlling means comprises a motor or solenoid and the vehicle further comprises means for receiving a battery to power the motor or solenoid and radio control means for controlling the application of power to the motor or solenoid. 10
7. Apparatus as claimed in claim 6 further comprising a drive motor for powering the vehicle and said radio control means further controls application of power to the drive motor. 15
8. Apparatus as claimed in any one of the preceding claims wherein each slot is partially covered to define a longitudinal extending opening narrower than the width of the slot for receiving a slot engagement member of a slot racing track vehicle. 20
9. Apparatus as claimed in claim 8 further comprising a racing vehicle having a slot engagement member having a lip wider than the opening for retention in the slot. 25
10. Apparatus as claimed in claim 9 wherein the member is of cylindrical form and is freely rotatable relative to the chassis, said lip being circular and disposed at one end of the member. 30
11. Apparatus as claimed in claim 10 further comprising a second lip disposed at the opposed end of the member, the second lip being coupled to the chassis. 35
12. A slot racing track comprises a plurality of connectable sections formed by slot track racing apparatus as claimed in any one of the preceding claims, the sections being connectable to form a continuous circuit. 40
13. A track as claimed in claim 12 further comprising a route changing section connected to the racing track sections, the route changing section being connected to an alternative track lane and provided with lane changing means to divert a vehicle from the racing track sections to the alternative track lane. 45
14. A track as claimed in claim 13 wherein the alternative track lane comprises a simulated pit area. 50
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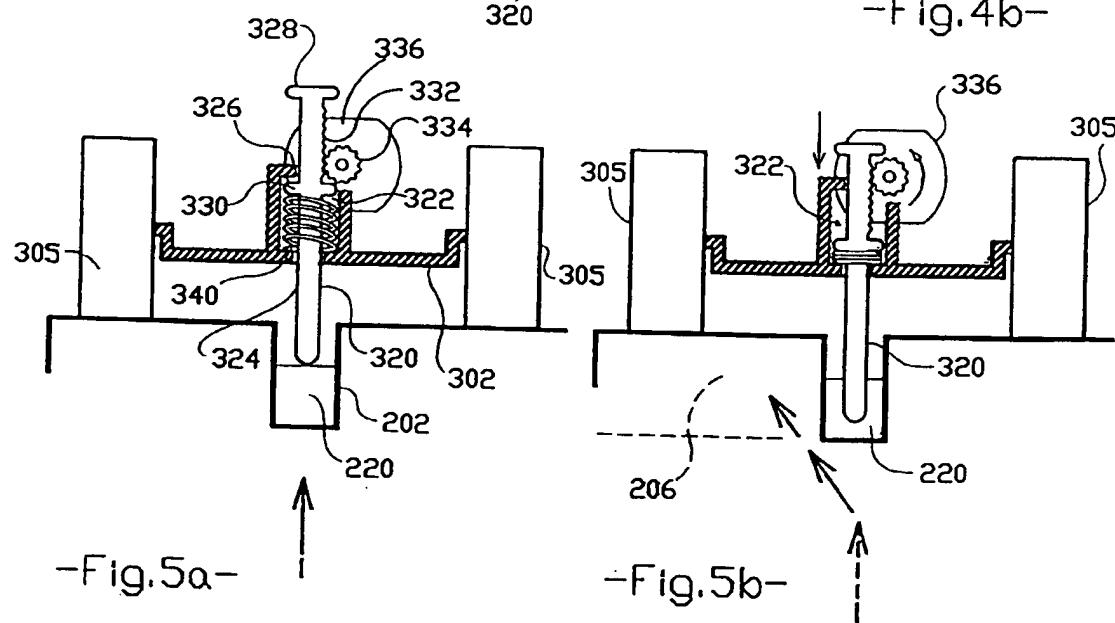
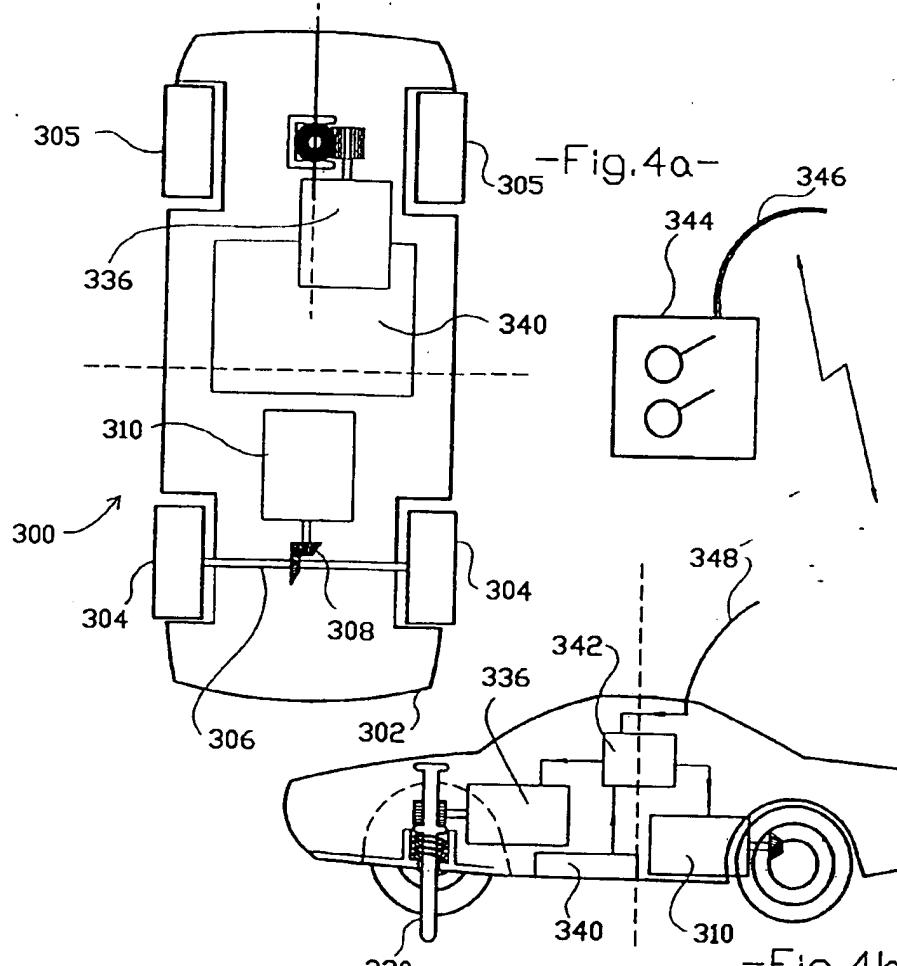
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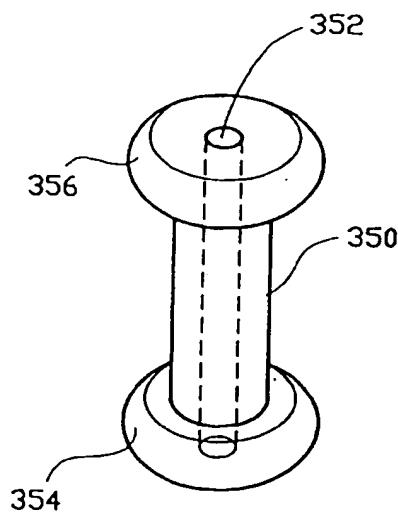
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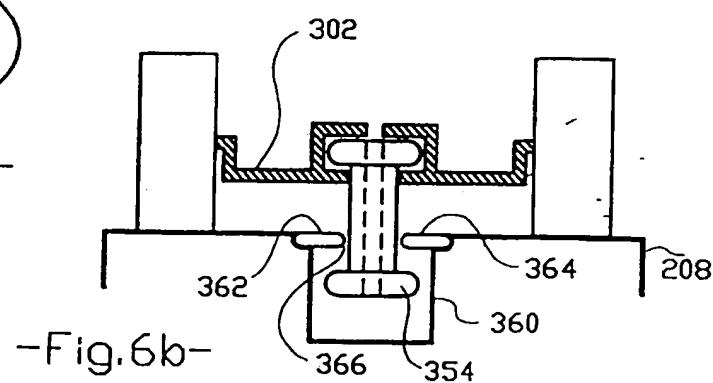
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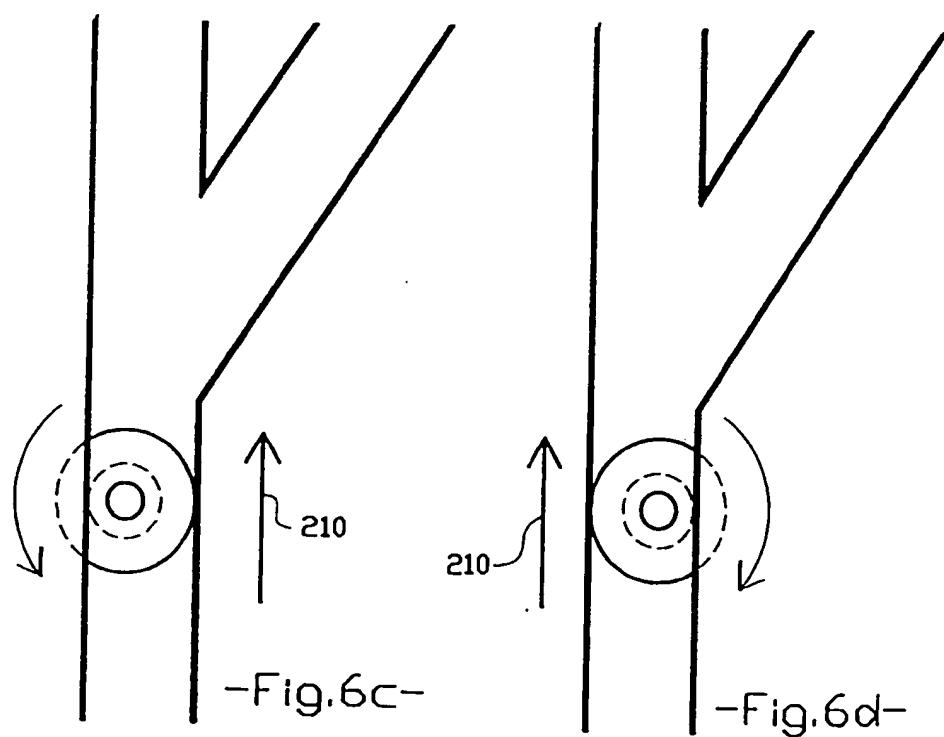
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-Fig.6a-



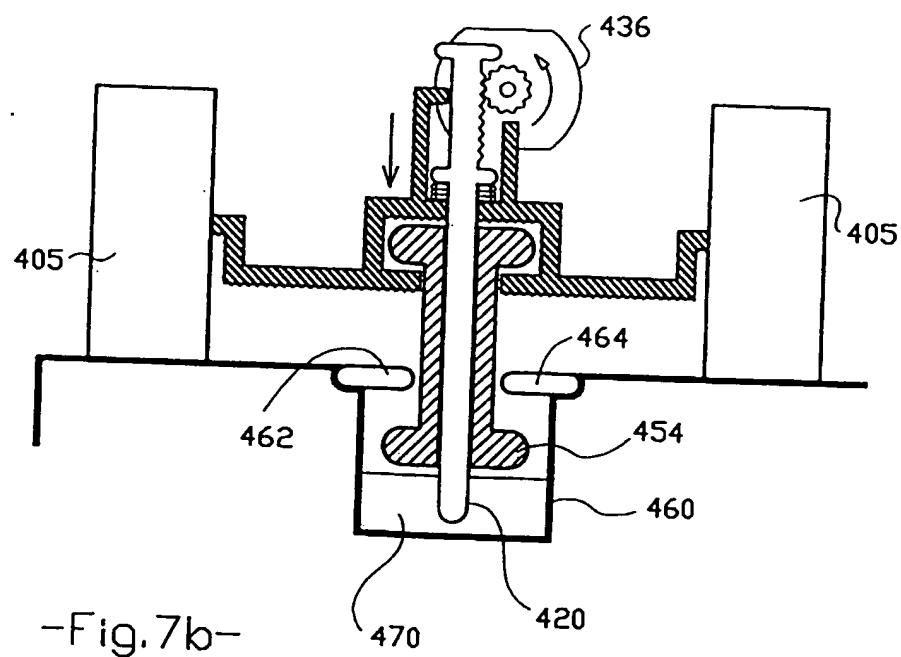
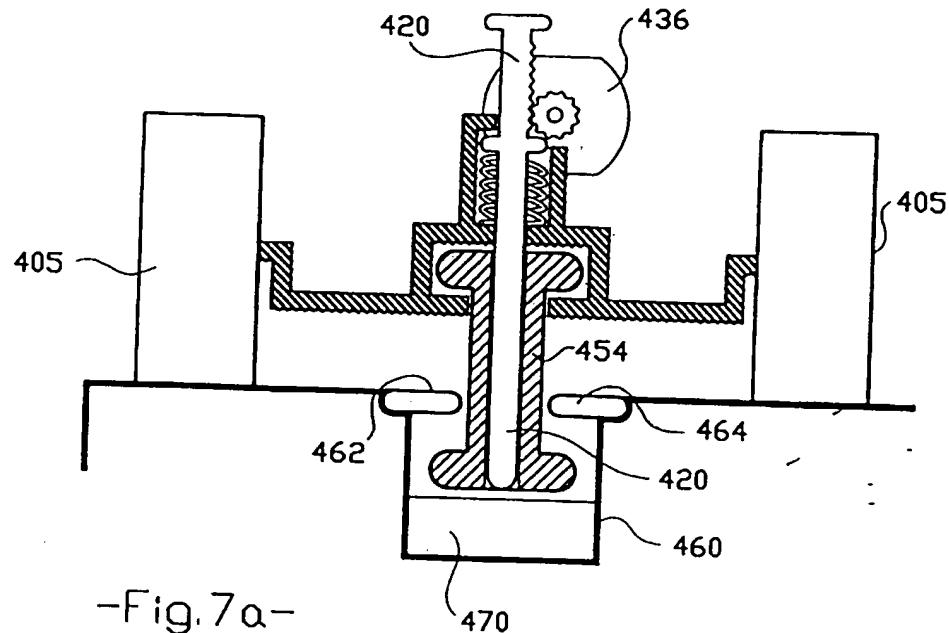
-Fig.6b-



-Fig.6c-

-Fig.6d-

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## EUROPEAN SEARCH REPORT

Application Number

EP 93 30 3052

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	GB-A-1 099 177 (LOUIS MARX & COMPANY LTD) * figures 6-8 *	1-14	A63H18/02 A63H18/08
Y	EP-A-0 280 920 (HESSE) * column 1, line 42 - column 2, line 2; figures 3-6 *	1-14	
A	EP-A-0 296 946 (IDEAL LOISIRS) * column 4, line 12 - line 26; figure 3 *	8, 9 10, 11	
Y	US-A-3 584 410 (LALONDE) * column 3, line 9 - line 11; figure 1 *	13, 14	
A	US-A-3 857 193 (GOLDGARB) * claim 1; figures 5,11 *	1	
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TECHNICAL FIELDS SEARCHED (Int. Cl.5)			
A63H			
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	26 JULY 1993	papa	
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